U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

TO ALL BILLFISHERS:

And so passes another outstanding Hawaiian International Billfish Tournament (HIBT) into history. The National Marine Fisheries Service (NMFS) has sent observers to the latest 17 of the 20 tournaments to gather biological data on game fishes, billfishes in particular. After the fishing and associated activities are over, we of the Honolulu Laboratory analyze the data and issue a report on the biological and statistical aspects of the tournament.

Before proceeding with the report, I would like to acknowledge all of you billfishers for your cooperation and support. It was your permission to allow us to inspect your fish and your faithful reporting at the radio round-ups that made it possible for Bob Humphreys and I to get the job done. Our sincere thanks also go to the tournament officials and community volunteers who assisted us in the data collecting. Peter Fithian and James Sutherland did their usual excellent job in the planning stages so that we could get right to work without a lot of worrisome preliminaries. Beverly and Phil Parker and Carol Zuzak gave us invaluable assistance at the radio round-ups. Colleen Bryant went out of her way to provide us with the data from the catch reports. Our work at the pier was certainly made easier by Jack Fischer. He could always be counted on for anything we needed and for setting up the equipment. Above all, special thanks to Chris Mason who assisted us with handling the numerous day to day details.

THE CATCH

Befitting the milestone of the 20th year of HIBT, the catch of billfish reached record breaking levels. The official tournament catch was 105 blue marlin, 2 striped marlin, 9 shortbill spearfish, and 43 ahi (yellowfin tuna) (Table 1). New HIBT records established are the number of blue marlin, the number of shortbill spearfish, and the total number of billfish (116). The catch is even more outstanding when one considers that in 1975, the previous record breaking year, there were 79 teams compared to the 65 teams this year. In fact the teams this year not only caught more billfish but caught more fish per team than the teams of 1975. The teams of 1978 beat the teams of 1975 by the diameter of a gnat's antenna...2.446 to 2.443 fish per team.

The largest blue marlin weighed 665 lb. The smallest was almost a tenth of the largest at 65.5 lb. The average weight of the blue marlin was 206.3 lb. The weights of the ahi ranged from 103.5 to

As I mentioned in my report for HIBT 1977 catch rates of blue marlin were highly correlated with the number of males caught and independent of the number of females caught. The numerous males and high catch rate of this year strengthened that correlation.

TACKLE, TIME, AND TIDE

Fifty-three blue marlin were caught on 24-kg (50-lb) test line and 52 on 36-kg (80-lb) test line. The ahi catch was almost as closely divided: 40 on 24-kg test line and 43 on 36-kg test line. Blue marlin caught on 24-kg line averaged 193.5 lb compared to an average weight of 219.3 lb for those caught on 36-kg line. On the other hand, ahi caught on the lighter line outweighed their heavier line counterparts 164.8 lb to 156.3 lb per individual. The largest blue marlin was caught on 24-kg line and the smallest on 36-kg line.

For 3 consecutive years beginning in 1975 the 11 a.m. to noon hour was the best for blue marlin. This year the 9-10 a.m. hour was slightly better than other times (Figure 2a), especially in area Sierra where seven were caught during that period. More ahi were caught between 2 and 3 p.m. than any other hour (Figure 2b). Other ahi catches were fairly evenly distributed throughout the fishing day except for the first hour.

Strike rates (number of strikes per boat-hour) were highest during the rising tide on the first, second, and fifth days of fishing (Figure 3). On the third and fourth days strike rates were best during low tide and the strike rates during the rising tide were almost equal to that at low tide. Except for the second day the period of lowest strike rates was at high tide or just before it. Area Victor, on the contrary, exhibited the highest strike rates during high tide. The strike rates in Victor during this period were two to four times higher than the average strike rate. Because of its distance from the starting point area Victor did not have any fishing effort during low tide which occurred at the beginning of the fishing day.

MARLIN DIET

Like other years the principal items found in marlin stomachs this year were tunas, opelu, and squid. Opelu occurred in a much greater percentage of the stomachs (56%) than usual (18%-34%). The list of the different species of fish found in the stomachs (Table 5) was roughly 50% longer than usual. None of the species was unusual; that is, all of them have been found in marlin stomachs before, at one time or another, but not all together in the same tournament.

Ten of the 96 stomachs examined were empty, that is, completely devoid of food. An interesting fact about the empty stomachs is

Table 1.--Numbers of qualifying game fish landed and teams fishing during Hawaiian International Billfish Tournaments, 1962-78.

Year	Blue marlin	Black marlin	Striped marlin	Shortbill spearfish	Sailfish	Yellowfin tuna ≥100 lb	Total qualifying fish	Number of teams	Number of boat-days fishing per fish[1]
1962	30	1	--	--	1	19	51	68	6.7
1963	19	2	1	--	--	26	48	72	7.5
1964	31	--	1	--	--	2	34	69	10.1
1965	47	--	--	--	--	9	56	78	6.9
1966	26	3	2	--	--	7	38	72	9.5
1967	63	--	1	--	--	18	82	68	4.2
1968	36	2	4	--	--	4	46	85	9.2
1969	32	1	--	--	--	4	37	75	10.1
1970	91	--	2	--	2	14	109	73	3.3
1971	41	--	3	1	--	47	92	77	3.4
1972	77	--	--	--	--	11	88	59	3.4
1973	76	--	1	3	1	17	98	61	3.1
1974	66	2	1	6	--	37	110	64	2.9
1975	104	--	2	8	--	79	193	79	2.0
1976	47	1	3	5	--	32	88	74	4.2
1977	71	--	1	1	--	14	87	73	4.2
1978	105	--	2	9	--	43	159	65	2.0

[1]Nine-hour fishing days, 1962-73; 8-h days, 1974-78.

Table 3.--Number of fish caught by species, area, and date, Hawaiian International Billfish Tournament, 1978.

Date 1978	Area											
	A	B	I	J	K	L	M	S	T	UA	UB	V
Blue marlin												
July 31	--	--	1	--	5	--	--	9	1	1	1	2
August 1	--	--	--	4	2	--	1	6	2	1	3	2
2	--	1	--	2	2	--	--	3	1	1	1	--
3	1	--	4	4	7	1	--	4	2	--	5	1
4	--	--	5	5	4	1	--	1	3	--	4	1
Sum	1	1	10	15	20	2	1	23	9	3	14	6
Average weight (lb)	335.0	122.0	226.8	198.1	194.5	257.3	127.0	228.2	169.7	159.7	214.5	196.3
Ahi												
July 31	--	--	--	4	3	1	--	4	1	1	2	2
August 1*	1	--	--	1	1	--	--	2	--	1	--	4
2	--	--	--	--	1	--	--	--	2	1	--	--
3	--	--	--	1	1	--	--	--	1	--	--	--
4	1	--	--	1	2	--	--	--	--	--	3	--
Sum	2			7	8	1		6	4	3	5	6
Average weight (lb)	140.5			146.7	179.9	188.0		212.3	136.0	142.7	153.9	156.1
Shortbill spearfish												
July 31	--	--	1	--	--	--	--	--	1	--	--	--
August 1*	--	--	--	--	--	--	--	--	--	1	--	--
2	--	--	--	--	2	--	--	--	--	--	--	1
3	--	--	1	--	--	1	--	--	--	--	--	--
Sum			2		2	1			1	1		1
Average weight (lb)			40.5		36.5	28.5			33.0	27.0		35.0
Striped marlin												
August 2	--	--	--	1	--	1	--	--	--	--	--	--
Weight (lb)				35		42						

*One fish caught in unspecified area.

Table 5.--Stomach contents of blue marlin, Hawaiian International Billfish Tournament, 1978.

Food items	Date and number of stomachs containing listed food items					Percent occurrence
	July	August				
	31	1	2	3	4	
Fish						
Tunas, Scombridae	8	8	5	14	12	49.0
Skipjack tuna	4	5	4	6	7	27.1
Other tunas	5	5	4	12	10	37.5
Jacks, Carangidae						
Opelu	4	10	4	21	15	56.3
Akule	--	--	--	1	--	1.0
Spiny puffer, Diodontidae	2	3	2	3	6	16.7
Mahimahi, Coryphaenidae	3	3	--	--	1	7.3
Snake mackerel, Gempylidae	1	--	--	4	1	6.3
Triggerfish, Balistidae	--	1	1	1	2	5.2
Aweoweo, Priacanthidae	--	--	1	--	3	4.2
Goatfish, Mullidae	--	--	--	1	3	4.2
Butterflyfish, Chaetodontidae	1	1	--	--	1	3.1
Squirrelfish, Holocentridae	--	1	1	1	--	3.1
Lancetfish, Alepisauridae	--	--	2	--	--	2.1
Sand lance, Ammodytidae	--	2	--	--	--	2.1
Flyingfish, Exocoetidae	1	--	--	--	--	1.0
Puffer, Tetraodontidae	1	--	--	--	--	1.0
Snipe eel, Nemichthyidae	1	--	--	--	--	1.0
Antigonia, Antigonidae	--	1	--	--	--	1.0
Needlefish, Belonidae	--	--	1	--	--	1.0
Ocean sunfish, Molidae	--	--	1	--	--	1.0
Cowfish, Ostraciidae	--	--	1	--	--	1.0
Surgeonfish, Acanthuridae	--	--	--	--	1	1.0
Unidentified fish	3	5	2	10	9	30.2
Invertebrates						
Squid, Loliginidae	8	12	6	12	9	49.0
Octopus, Octopodidae	--	--	1	--	--	1.0
Empty or everted stomachs	4	5	3	3	2	17.7
Number of stomachs examined	17	21	10	26	22	
Total: 96						

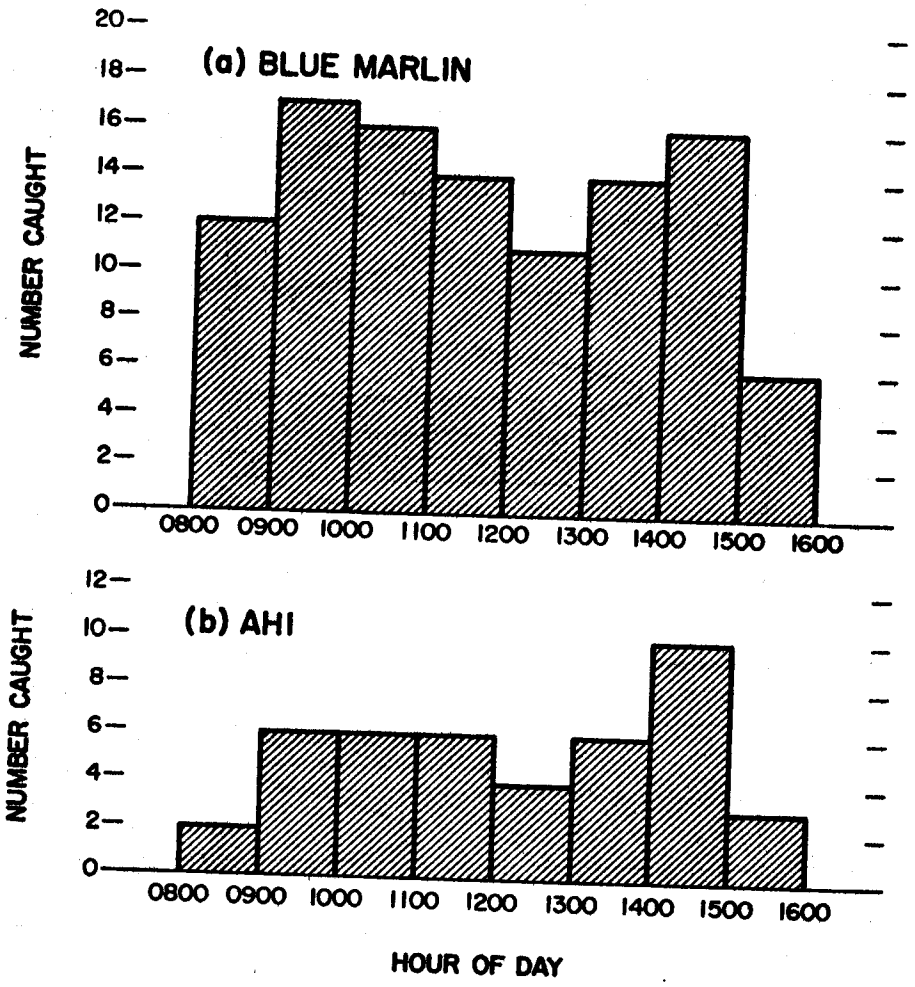

Figure 2.--Fish catch throughout the day by hours.